

Refine Search

Search Results -

Term	Documents
@PD	37875214
(54 AND (@PD > "20061013")).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0
(L54 AND @PD > 20061013).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0

Database:

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Search:

Search History

DATE: Friday, October 13, 2006 [Purge Queries](#) [Printable Copy](#) [Create Case](#)

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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ

L55 L54 and @pd > 20061013

0 L55

L54 L53 and L30

18 L54

L53 L52 and L28 and L29

24 L53

L52 L51 and L33 and L32

28 L52

L51 6377044 or 6169401 or 5621323 or 5578925 or 5471142 or 5144243 or
 5030915 or 4918388

141 L51

L50 L49 and combine\$4

7 L50

L49 6377044 and L33

7 L49

L48 6377044 and L33 and L42

0 L48

<u>L47</u>	6377044 and L28 and L29 and L30 and L31 and L32 and L33 and L42	0	<u>L47</u>
<u>L46</u>	6377044	11	<u>L46</u>
<u>L45</u>	L44 and L29 and L30 and L31 and L32 and L33 and L42	6	<u>L45</u>
	(324/300 324/301 324/302 324/303 324/304 324/305 324/306 324/307 324/308 324/309 324/310 324/311 324/312 324/313 324/314 324/315 324/316 324/317 324/318 324/319 324/320 324/321 324/322).ccls. or (600/410 600/411 600/412 600/413 600/414 600/415 600/416 600/417 600/418 600/419 600/420 600/421 600/422).ccls.	11687	<u>L44</u>
<u>L43</u>	L42 and L33 and L32 and L31	12	<u>L43</u>
<u>L42</u>	L28 and (similar with plane)	968	<u>L42</u>
<u>L41</u>	L40 and similar	30	<u>L41</u>
<u>L40</u>	L38 and (plane)	44	<u>L40</u>
<u>L39</u>	L38 and (similar near plane)	1	<u>L39</u>
<u>L38</u>	L37 and loop	50	<u>L38</u>
<u>L37</u>	L34 and L30	89	<u>L37</u>
<u>L36</u>	L34 and L29 and L30	89	<u>L36</u>
<u>L35</u>	L34 and L29 and L30 and L31	89	<u>L35</u>
<u>L34</u>	L33 and L32	250	<u>L34</u>
<u>L33</u>	L28 and quadrature	5488	<u>L33</u>
<u>L32</u>	L28 and (signal near combine\$3)	876	<u>L32</u>
<u>L31</u>	L29 and ((receiv\$4 and transmit\$4) or (rf near coil))	10251	<u>L31</u>
<u>L30</u>	L29 and ((receiv\$4 and transmit\$4) and (rf near coil))	2744	<u>L30</u>
<u>L29</u>	L28 and gradient	54566	<u>L29</u>
<u>L28</u>	(magnetic adj resonance) or nmr or mri	237017	<u>L28</u>
<u>L27</u>	L26 and L3	18	<u>L27</u>
<u>L26</u>	L25 and L1 and L2	24	<u>L26</u>
<u>L25</u>	L24 and L6 and L5	28	<u>L25</u>
<u>L24</u>	6377044 or 6169401 or 5621323 or 5578925 or 5471142 or 5144243 or 5030915 or 4918388	141	<u>L24</u>
<u>L23</u>	L22 and combine\$4	7	<u>L23</u>
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<u>L21</u>	6377044 and L6 and L15	0	<u>L21</u>
<u>L20</u>	6377044 and L1 and L2 and L3 and L4 and L5 and L6 and L15	0	<u>L20</u>
<u>L19</u>	6377044	11	<u>L19</u>
<u>L18</u>	L17 and L2 and L3 and L4 and L5 and L6 and L15	6	<u>L18</u>
<u>L17</u>	324/300-322.ccls. or 600/410-422.ccls.	11687	<u>L17</u>
<u>L16</u>	L15 and L6 and L5 and L4	12	<u>L16</u>
<u>L15</u>	L1 and (similar with plane)	968	<u>L15</u>
<u>L14</u>	L13 and similar	30	<u>L14</u>
<u>L13</u>	L11 and (plane)	44	<u>L13</u>
<u>L12</u>	L11 and (similar near plane)	1	<u>L12</u>
<u>L11</u>	L10 and loop	50	<u>L11</u>

<u>L10</u>	L7 and L3	89	<u>L10</u>
<u>L9</u>	L7 and L2 and L3	89	<u>L9</u>
<u>L8</u>	L7 and L2 and L3 and L4	89	<u>L8</u>
<u>L7</u>	L6 and L5	250	<u>L7</u>
<u>L6</u>	L1 and quadrature	5488	<u>L6</u>
<u>L5</u>	L1 and (signal near combine\$3)	876	<u>L5</u>
<u>L4</u>	L2 and ((receiv\$4 and transmit\$4) or (rf near coil))	10251	<u>L4</u>
<u>L3</u>	L2 and ((receiv\$4 and transmit\$4) and (rf near coil))	2744	<u>L3</u>
<u>L2</u>	L1 and gradient	54566	<u>L2</u>
<u>L1</u>	(magnetic adj resonance) or nmr or mri	237017	<u>L1</u>

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 18 of 18 returned.

☐ 1. Document ID: US 5666055 A Relevance Rank: 86

L27: Entry 13 of 18

File: USPT

Sep 9, 1997

US-PAT-NO: 5666055

DOCUMENT-IDENTIFIER: US 5666055 A

TITLE: Surface coil system for a single channel NMR receiver

DATE-ISSUED: September 9, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jones; Randall W.	Elkhorn	NE	68022	
Davis; Fred	LaVista	NE	68128	

APPL-NO: 08/537534 [PALM]

DATE FILED: October 2, 1995

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
CIPS <u>G01 R 33/3415</u>	20060101
CIPS <u>G01 R 33/34</u>	20060101

US-CL-ISSUED: 324/318; 324/322, 128/653.5

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 128/653.2, 128/653.3, 324/300, 324/307, 324/309, 324/310, 324/311, 324/312, 324/313, 324/314, 324/318, 324/322

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4752738</u>	June 1988	Patrick et al.	324/309
<u>4825162</u>	April 1989	Rosmer et al.	324/318

<u>4924868</u>	May 1990	Krause et al.	128/653SC
<u>5086275</u>	February 1992	Roemer	324/309
<u>5097210</u>	March 1992	Requardt et al.	324/318
<u>5144243</u>	September 1992	Nakabayashi et al.	324/318
<u>5202634</u>	April 1993	Potthast et al.	324/322
<u>5430378</u>	July 1995	Jones	324/318

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: Zarley, McKee, Thomte, Voorhees & Sease Frederiksen; Mark D.

ABSTRACT:

A surface coil system for single channel MRI reception comprising a coil system including a plurality of self-resonant, overlapping coil conductor sections arranged relative to one another and to anatomical regions of a patient such that a combination of regions form a desired larger region of interest, a control unit located remotely from the coil system and electromagnetically communicating therewith, having means for selectively electronically activating and deactivating each coil section to produce MRI output signals when activated, means for combining selected MRI output signals, and means for electrically connecting the coil system to an MRI system to transmit selected MRI signals to the MRI system.

20 Claims, 13 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	LOC	Draw D
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☐ 2. Document ID: US 5394087 A Relevance Rank: 85

L27: Entry 16 of 18

File: USPT

Feb 28, 1995

US-PAT-NO: 5394087

DOCUMENT-IDENTIFIER: US 5394087 A

TITLE: Multiple quadrature surface coil system for simultaneous imaging in magnetic resonance systems

DATE-ISSUED: February 28, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Molyneaux; David A.	Willowick	OH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Picker International, Inc.	Highland Hts.	OH			02

A quadrature multiple coil array (30) includes a plurality of quadrature coil pairs (50.sub.1, 50.sub.2, . . . , 50.sub.n). Each coil pair includes a loop coil (50) or other coil which is sensitive to radio frequency signal components that are perpendicular to the coil and a flat Helmholtz coil (54) or other coil which is sensitive to radio frequency components parallel to the plane of the coil. The coils of each of the quadrature coil pairs are overlapped (56) by an amount which minimizes coupling between the coils. This enables resonance signals to be picked-up concurrently in quadrature by each of the quadrature pairs and be demodulated by a corresponding series of receivers (32.sub.1, 32.sub.2, . . . , 32.sub.n). The data from the overlapping regions to which each quadrature pair is sensitive are reconstructed (36) into image representations (38). The image representations are aligned either automatically (40) or by the operator and displayed on a video monitor (44). The overlapping quadrature pairs can be arranged along a planar substrate or along curved substrates which conform to contours of the anatomy of the subject.

23 Claims, 11 Drawing figures

Full	Title	Creation	Print	Review	Classification	Date	Reference			Claims	K04C	Draw D
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☐ 3. Document ID: US 5548218 A Relevance Rank: 85

L27: Entry 14 of 18

File: USPT

Aug 20, 1996

US-PAT-NO: 5548218

DOCUMENT-IDENTIFIER: US 5548218 A

TITLE: Flexible RF coils for MRI system

DATE-ISSUED: August 20, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lu; Dongfeng	Williston Park	NY		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
North Shore University Hospital Research Corporation	Manhasset NY				02	

APPL-NO: 08/545081 [PALM]

DATE FILED: October 19, 1995

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
CIPN <u>G01 R 33/3415</u>	20060101
CIPS <u>G01 R 33/34</u>	20060101

that can be operated to function as the equivalent of one butterfly coil and one single loop coil.

16 Claims, 9 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	IMC	Draw U.
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☐ 4. Document ID: US 6501274 B1 Relevance Rank: 80

L27: Entry 10 of 18

File: USPT

Dec 31, 2002

US-PAT-NO: 6501274

DOCUMENT-IDENTIFIER: US 6501274 B1

TITLE: Magnetic resonance imaging system using coils having paraxially distributed transmission line elements with outer and inner conductors

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Nova Medical, Inc.	Wakefield	MA			02

APPL-NO: 09/684680 [PALM]

DATE FILED: October 7, 2000

PARENT-CASE:

RELATED APPLICATIONS The applicant herein claims the benefit of U.S. Provisional Patent Application No. 60/159,662, dated Oct. 15, 1999 for HIGH RESOLUTION MAGNETIC RESONANCE IMAGING SYSTEM in the name of Patrick Ledden, the applicant herein.

INT-CL-ISSUED: [07] G01V 3/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	<u>G01 R 33/32</u>	20060101
CIPS	<u>G01 R 33/36</u>	20060101

US-CL-ISSUED: 324/318

US-CL-CURRENT: 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318-322

See application file for complete search history.

PRIOR-ART-DISCLOSED:

☐ 5. Document ID: US 7012429 B1 Relevance Rank: 80

L27: Entry 3 of 18

File: USPT

Mar 14, 2006

US-PAT-NO: 7012429

DOCUMENT-IDENTIFIER: US 7012429 B1

TITLE: Magnetic resonance imaging system using coils having distributed transmission line elements with outer and inner conductors

DATE-ISSUED: March 14, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ledden; Patrick	Malden	MA		US

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Nova Medical, Inc.	Wilmington	MA		US	02

APPL-NO: 10/329200 [PALM]

DATE FILED: December 24, 2002

RELATED-US-APPL-DATA:

continuation parent-doc US 09684680 00 20001007 US 6501274 A child-doc US 10329200
us-provisional-application US 60159662 00 19991015

INT-CL-ISSUED:

TYPE	IPC	DATE	IPC-OLD
IPCP	G01V3/00	20060101	G01V003/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	<u>G01 V 3/00</u>	20060101

US-CL-ISSUED: 324/318

US-CL-CURRENT: 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/307, 324/309, 324/300
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4439733</u>	March 1984	Hinshaw et al.	324/322
<u>4638253</u>	January 1987	Jaskolski et al.	324/311
<u>5144243</u>	September 1992	Nakabayashi et al.	324/318

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	DOC	Draw D.
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☐ 6. Document ID: US 6377044 B1 Relevance Rank: 80

L27: Entry 11 of 18

File: USPT

Apr 23, 2002

US-PAT-NO: 6377044

DOCUMENT-IDENTIFIER: US 6377044 B1

TITLE: Multi-mode receiver coils for MRI

DATE-ISSUED: April 23, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Burl; Michael	Chagrin Falls	OH		
Missal; John W.	Willoughby	OH		
Chmielewski; Thomas	Willoughby Hills	OH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Philips Medical Systems (Cleveland), Inc.	Highland Heights	OH				02

APPL-NO: 09/516644 [PALM]

DATE FILED: March 1, 2000

INT-CL-ISSUED: [07] G01V 3/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	<u>G01 R 33/34</u>	20060101
CIPN	<u>G01 R 33/3415</u>	20060101

US-CL-ISSUED: 324/307; 324/309, 324/318, 324/322

US-CL-CURRENT: 324/307; 324/309, 324/318, 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/309, 324/318, 324/319, 324/322, 324/307, 324/311, 324/314, 324/306, 324/300

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4918388</u>	April 1990	Mehdizadeh et al.	324/322

<u>5138260</u>	August 1992	Molyneaux et al.	324/309
<u>5374890</u>	December 1994	Zou et al.	324/318
<u>5394087</u>	February 1995	Molyneaux et al.	324/318
<u>5510711</u>	April 1996	Molyneaux et al.	324/309
<u>5757189</u>	May 1998	Molyneaux et al.	324/318
<u>6097186</u>	August 2000	Nabetani et al.	324/319

ART-UNIT: 2862

PRIMARY-EXAMINER: Williams; Hezron

ASSISTANT-EXAMINER: Fetzner; Tiffany A.

ATTY-AGENT-FIRM: Fay, Sharpe, Fagan, Minnich & McKee, LLP

ABSTRACT:

A magnetic resonance apparatus includes a multi-mode receiver assembly which facilitates operation in both a quadrature combination mode and phased array mode. The multi-mode receiver assembly includes a receiver coil assembly (30) comprising a first RF coil assembly (32) and a second RF coil assembly (34). A signal combining circuit, which includes a switch means, performs at least one of combining and splitting magnetic resonance signals received by the first and second RF coil assemblies (30, 32). The application of a DC bias potential to the switch means switches the multi-mode receiver assembly into the quadrature combination mode in which the received magnetic resonance signals are phase shifted and combined into a quadrature signal and an anti-quadrature signal. The absence of a DC bias potential to the switch means switches the multi-mode receiver assembly into the phased array mode in which the received magnetic resonance signals are phase shifted and passed individually to corresponding receivers. The multi-mode capability of the receiver assembly allows an operator to switch from a quadrature mode, which provides faster reconstruction, to a phased array mode, which provides better image quality, within a single examination.

13 Claims, 4 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	NOAC	Draw D.
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☐ 7. Document ID: US 20060226840 A1 Relevance Rank: 79

L27: Entry 1 of 18

File: PGPB

Oct 12, 2006

PGPUB-DOCUMENT-NUMBER: 20060226840

PGPUB-FILING-TYPE:

DOCUMENT-IDENTIFIER: US 20060226840 A1

TITLE: Phased array coils utilizing selectable quadrature combination

PUBLICATION-DATE: October 12, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chmielewski; Thomas	Willoughby Hills	OH	US
Shvartsman; Shmaryu	Highland Heights	OH	US

APPL-NO: 10/553175 [PALM]
DATE FILED: April 2, 2004

RELATED-US-APPL-DATA:

us-provisional-application US 60463639 20030418

PCT-DATA:

DATE-FILED	APPL-NO	PUB-NO	PUB-DATE	371-DATE
Apr 2, 2004	PCT/IB04/01146			Oct 14, 2005

INT-CL-PUBLISHED:

TYPE	IPC	DATE	IPC-OLD
IPCP	G01V3/00	20060101	G01V003/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01 V 3/00	20060101

US-CL-PUBLISHED: 324/322; 324/318

US-CL-CURRENT: 324/322; 324/318

ABSTRACT:

A magnetic resonance imaging apparatus includes a main magnet (12) for generating a main magnetic field in an examination region (14), a plurality of gradient coils (22) for setting up magnetic field gradients in the main field, an RF transmit coil for transmitting RF signals into the examination region to excite magnetic resonance in a subject disposed therein, and an RF receive coil (16) for receiving RF signals from the subject. The RF receive coil includes a first loop (101) and a second loop (102), the first and second loops being disposed substantially in a similar plane (x-z). Also included is a signal combiner (120) for combining the signals received by the first and second loops in quadrature.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	Keywords	Drawings
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☐ 8. Document ID: US 5543711 A Relevance Rank: 79

L27: Entry 15 of 18

File: USPT

Aug 6, 1996

US-PAT-NO: 5543711

DOCUMENT-IDENTIFIER: US 5543711 A

TITLE: Multiple quadrature volume coils for magnetic resonance imaging

"The NMR Phased Array", Roemer, et al., Academic Press, Inc. 1990. Magnetic Resonance in Medicine 16, 192-225 (1990).
"Weighting Functions for Combination of NMR Images Obtained with Multiple Surface Coils", Reykowski, et al., p. 519 SMRM Aug. 1990 9th Ann. Meeting.
"Modification of an MR Receiver for Simultaneous Image Acquisition From Two Channels", Wright, p. 533 SMRM Aug. 1989 8th Ann. Meeting.
"Improvement of SNR at Low Field Strength Using Mutually Decoupled Coils For Simultaneous NMR Imaging", Leussler, et al., p. 724 SMRM Aug. 1990 9th Annual Meeting.
"Volume Imaging with MR Phased Arrays", Hayes, et al. p. 175 SMRM Aug. 1989 8th Annual Meeting.
"Optimized Birdcage Resonators for Simultaneous MRI of Head and Neck", Leussler, SMRM 1993, p. 1349.
"An Efficient, Highly Homogeneous Radiofrequency Coil for Whole-Body NMR Imaging at 1.5 T", Hayes, et al., pp. 622-628.
"The Theory of the Bird-Cage Resonator", Tropp, Journal of Magnetic Resonance, 82, 51-62 (1989).
"A 64 MHz Half-Birdcage Resonator for Clinical Imaging", Ballon, et al. Journal of Magnetic Resonance 90, 131-140 (1990).
"Head and Neck Vascular Array Coil For MRI", Srinivasan, et al., Society of Magnetic Resonance, 2nd Annual Meeting, San Francisco, CA (1994) p. 1107.

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: Fay, Sharpe, Beall, Fagan, Minnich & McKee

ABSTRACT:

A birdcage coil (42) and a quadrature coil pair which are disposed in a partially overlapping but electrically isolated relationship within a static magnetic field generated by a main field magnet (10). The birdcage coil preferably has twelve legs, has eight-fold symmetry, and is tuned to have two linear modes aligned with first and second orthogonal axes. The quadrature coil includes a first or upper coil portion (90) having an even-number of legs and a mode aligned with a third axis. A second or bottom quadrature coil (92) has an odd-number of legs and has a mode which is aligned with a fourth axis, preferably orthogonal to the third axis. Received resonance signals of the two modes of the birdcage coil are combined (66) and digitized (64); resonance signals received in the first and second modes of the quadrature coil pair are combined (66) and digitized (64). The digitized magnetic resonance signals are reconstructed (72) into an image representation, selective portions of which are displayed on a video monitor (52). Biasing voltages (106) are selectively applied to the birdcage and quadrature coils in order to deactivate one of the coils such that only the other coil receives resonance signals.

23 Claims, 7 Drawing figures

Full	Title	Origin	Front	Review	Classification	Date	Reference	Claims	Keywords	Drawings
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☐ 9. Document ID: US 5951474 A Relevance Rank: 79

L27: Entry 12 of 18

File: USPT

Sep 14, 1999

<u>5307806</u>	May 1994	Jones	128/653.5
<u>5351688</u>	October 1994	Jones	128/653.5
<u>5361765</u>	November 1994	Herihy	128/653.5
<u>5370118</u>	December 1994	Vij	128/653.5
<u>5394087</u>	February 1995	Molyneaux	324/318
<u>5465719</u>	November 1995	Itagaki et al.	128/653.5
<u>5473251</u>	December 1995	Mori	324/318
<u>5500596</u>	March 1996	Grist et al.	324/318
<u>5502387</u>	March 1996	McGill	324/318
<u>5581185</u>	December 1996	Petropoulos et al.	324/318
<u>5655533</u>	August 1997	Petropoulos et al.	128/653.5

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0565178 A1	January 1993	EP	

OTHER PUBLICATIONS

"A Highly Sensitive Multiple RF Coil For Magnetic Resonance Imaging", T. Takahashi et al, Research & Development Center, Hitachi Medical Corporation, pp. 215-217.

ART-UNIT: 377

PRIMARY-EXAMINER: Jaworski; Francis J.

ASSISTANT-EXAMINER: Mercader; Eleni Mantis

ATTY-AGENT-FIRM: Antonelli, Terry, Stout & Kraus, LLP

ABSTRACT:

RF receiving coil device used in a magnetic resonance imaging apparatus capable of acquiring a tomographic image of an object under examination positioned in a static magnetic field along a predetermined direction including quadrature detection coils for detecting an MR signal component along a direction perpendicular to a body axis direction of the object under examination and also perpendicular to a direction of the static magnetic field, and for detecting another MR-signal component along the body axis direction.

24 Claims, 13 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	IMC	Draw D

☐ 10. Document ID: US 6836117 B2 Relevance Rank: 79

L27: Entry 4 of 18

File: USPT

Dec 28, 2004

<u>5594337</u>	January 1997	Boskamp	324/318
<u>5708361</u>	January 1998	Wang et al.	
<u>5757189</u>	May 1998	Molyneaux et al.	324/318
<u>5973495</u>	October 1999	Mansfield	
<u>6097186</u>	August 2000	Nabetani	
<u>6137291</u>	October 2000	Szumowski et al.	324/318
<u>6300761</u>	October 2001	Hagen et al.	324/318
<u>6348794</u>	February 2002	Nabetani et al.	
<u>6438402</u>	August 2002	Hashoian et al.	600/410
<u>6591128</u>	July 2003	Wu et al.	600/422
<u>2003/0197508</u>	October 2003	Tamura et al.	324/318

OTHER PUBLICATIONS

Jones "Twelve Antenna Element Lower Extremity/Pelvic Array for MRI" Proceedings of the International Society for Magnetic Resonance in Medicine Sixth Scientific Meeting and Exhibition vol. 1 ISSN 1065-9889 Sydney, Australia Apr. 18-24, 1998 p. 440.

ART-UNIT: 2859

PRIMARY-EXAMINER: Gutierrez; Diego

ASSISTANT-EXAMINER: Fetzner; Tiffany A.

ATTY-AGENT-FIRM: Horton, Esq.; Carl B. Armstrong Teasdale LLP

ABSTRACT:

For the purpose of enabling proper imaging of the prostate, a first saddle coil 210 having two loop portions of a geometry suited for sandwiching the lower abdomen of a human body from the anterior and posterior sides with the two loop portions facing each other, and a second saddle coil 310 having two loop portions of a geometry suited for allowing the lower limbs of the human body to be inserted into the two loop portions, and sandwiching the lower abdomen from the right and left sides with the two loop portions facing each other, are quadrature-arranged so that the phases of magnetic resonance received signals are different by 90.degree., thus achieving imaging of the lower abdomen of the human body with a high S/N.

8 Claims, 16 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMC	Draw D
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☐ 11. Document ID: US 7026818 B2 Relevance Rank: 79

L27: Entry 2 of 18

File: USPT

Apr 11, 2006

US-PAT-NO: 7026818

DOCUMENT-IDENTIFIER: US 7026818 B2

imaging conditions are for example directed to parallel MR imaging.

17 Claims, 38 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	FIGS	Drawings
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☐ 12. Document ID: US 6747454 B2 Relevance Rank: 79

L27: Entry 6 of 18

File: USPT

Jun 8, 2004

US-PAT-NO: 6747454

DOCUMENT-IDENTIFIER: US 6747454 B2

TITLE: Array of coils for use in imaging the vasculature of a patient

DATE-ISSUED: June 8, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Belt; Kenneth W.	Fort Atkinson	WI		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Medrad, Inc.	Indianola	PA			02

APPL-NO: 10/252196 [PALM]

DATE FILED: September 23, 2002

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This application for patent is a divisional of U.S. application Ser. No. 10/015,190, filed Nov. 26, 2001, which itself is a divisional of U.S. application Ser. No. 08/978,718, filed Nov. 26, 1997, now issued as U.S. Pat. No. 6,323,648 on Nov. 27, 2001. This application thus claims the benefit of the filing date of the grandparent application, Nov. 26, 1997.

INT-CL-ISSUED: [07] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
CIPS <u>G01 R 33/34</u>	20060101
CIPS <u>G01 R 33/3415</u>	20060101

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/300, 324/306, 324/307, 324/309, 324/312, 324/314, 600/420, 600/421, 600/422

See application file for complete search history.

PRIOR-ART-DISCLOSED:

(1987).

Wang, J., "A Novel Method to Reduce the Signal Coupling of Surface Coils for MRI," ISMRM, vol. 3, p. 1434 (1996).

Baum, R. A., et al., "Multicenter Trial to Evaluate Vascular Magnetic Resonance Angiography of the Lower Extremity," JAMA, vol. 274, No. 11, pp. 875-880 (1995).
Medical Advances, The Whole Picture: The New Medical Advances Peripheral Vascular Coil, promotional brochure.

Lang, E. K., "A Survey of the Complications of Percutaneous Retrograde Arteriography," Seldinger Technic, Radiology, 81: pp. 257-263 (1963).

Hessel, S. J., et al., "Complications of Angiography," Radiology, 138: pp. 273-281 (1981).

ART-UNIT: 2859

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Stevenson; James R.

ABSTRACT:

An array of coils is configured for use in imaging the vasculature of a patient. The array of coils comprises first and second pluralities of coil pairs for deployment longitudinally along anterior and posterior surfaces, respectively, of the patient. In the first plurality, each coil pair has first and second loops positioned laterally about right and left sides, respectively, of the anterior surface for receiving therefrom magnetic resonance signals. In the second plurality, each coil pair has first and second loops positioned laterally about right and left sides, respectively, of the posterior surface for receiving therefrom magnetic resonance signals. Means are provided for laterally isolating the first and second loops relative to each other for each coil pair. Means are provided for longitudinally isolating the coil pairs relative to each other. Means also vertically isolate the coil pairs of the first plurality from those of the second plurality.

25 Claims, 31 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	NOAC	Draw D.
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☐ 13. Document ID: US 6825660 B2 Relevance Rank: 79

L27: Entry 5 of 18

File: USPT

Nov 30, 2004

US-PAT-NO: 6825660

DOCUMENT-IDENTIFIER: US 6825660 B2

**** See image for Certificate of Correction ****

TITLE: Degenerate birdcage resonator for magnetic resonance imaging

DATE-ISSUED: November 30, 2004

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

An apparatus for magnetic resonance imaging is disclosed. In an exemplary embodiment, the apparatus includes a degenerate birdcage coil having a pair of opposing rings and a plurality of rungs positioned circumferentially around the pair of rings. Input excitation circuitry is used for applying excitation radio frequency (RF) energy to the degenerate birdcage coil at a first resonance mode of the coil. In addition, output receiving circuitry is used for receiving RF energy emitted by an object positioned within the degenerate birdcage coil. The output receiving circuitry receives the emitted RF energy at a plurality of resonance modes of the degenerate birdcage coil, including said first resonance mode. Thereby, the degenerate birdcage coil may be used as a phased array or for sensitivity encoding.

31 Claims, 14 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	Index	Unsol. D.
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☐ 14. Document ID: US 5370118 A Relevance Rank: 79

L27: Entry 17 of 18

File: USPT

Dec 6, 1994

US-PAT-NO: 5370118

DOCUMENT-IDENTIFIER: US 5370118 A

TITLE: Opposed loop-pair quadrature NMR coil

DATE-ISSUED: December 6, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vij; Kamal	New Berlin	WI		
Boskamp; Eddy B.	Menomonee Falls	WI		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Medical Advances, Inc.	Milwaukee	WI			02

APPL-NO: 08/172689 [PALM]

DATE FILED: December 23, 1993

INT-CL-ISSUED: [05] A61B.5/055, G01R 33/48

INT-CL-CURRENT:

TYPE IPC	DATE
CIPN <u>G01 R 33/3415</u>	20060101
CIPS <u>G01 R 33/34</u>	20060101

US-CL-ISSUED: 128/653.5; 324/318, 324/322, 324/311

US-CL-CURRENT: 600/422; 324/311, 324/318, 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 128/653.2, 128/653.5, 324/300, 324/307, 324/309,

324/318, 324/322, 324/311

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4712067</u>	December 1987	Roschmann et al.	324/318
<u>4816765</u>	March 1989	Boskamp	324/318
<u>4825162</u>	April 1989	Roemer et al.	324/318
<u>4879516</u>	November 1989	Mehdizadeh et al.	324/318
<u>4882540</u>	November 1989	Domenick et al.	128/653.5
<u>5030915</u>	July 1991	Boskamp et al.	324/318
<u>5057777</u>	October 1991	Kurczewski	324/318
<u>5221902</u>	June 1993	Jones et al.	128/653.5
<u>5241272</u>	August 1993	Friedrich	128/653.5
<u>5302901</u>	April 1994	Snelton	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
3272739	December 1991	JP	128/653.2

ART-UNIT: 335

PRIMARY-EXAMINER: Pfaffle; K. M.

ATTY-AGENT-FIRM: Quarles & Brady

ABSTRACT:

A quadrature local coil includes two coil sets placed on opposite sides of the patient, each coil set having a single loop and a split loop so as to be sensitive to quadrature components of a flux field substantially centered between the coil sets. Signals are developed from the loops in a manner to reduce current flow in the loops preventing coupling of the opposing loops and the degradation of the signal. The signals may be summed to produce a single signal of improved signal-to-noise ratio.

6 Claims, 10 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMC	Draw
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☐ 15. Document ID: US 6714012 B2 Relevance Rank: 79

Wang, J., "A Novel Method to Reduce the Signal Coupling of Surface Coils for MRI," ISMRM, vol. 3, p. 1434 (1996).
Baum, R. A., et al., "Multicenter Trial to Evaluate Vascular Magnetic Resonance Angiography of the Lower Extremity," JAMA, vol. 274, No. 11, pp. 875-880 (1995).
Medical Advances, The Whole Picture: The New Medical Advances Peripheral Vascular Coil, promotional brochure.
Lang, E. K., "A Survey of the Complications of Percutaneous Retrograde Arteriography," Seldinger Technic, Radiology, 81: pp. 257-263 (1963).
Hessel, S. J., et al., "Complications of Angiography," Radiology, 138: pp. 273-281 (1981).

ART-UNIT: 2859

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Stevenson; James R. Bradley; Gregory L.

ABSTRACT:

An apparatus enables a patient to be positioned optimally for a scanning procedure during which images are to be obtained of the vasculature of the patient. The apparatus includes a lumbar support, a tray, and a leg support. The lumbar support allows the renal portion of the vasculature to be positioned predominately in a single plane. The tray allows the pelvic and femoral portions of the vasculature to be positioned substantially coplanar with each other and with the renal portion of the vasculature. The leg support allows the lower leg and feet portions of the vasculature to be positioned substantially coplanar with each other and with the pelvic and femoral portions of the vasculature. The substantial coplanar alignment of the portions of the vasculature enables the images thereof to be obtained with a smaller field of view and thus at least one of greater resolution and reduced scanning time.

41 Claims, 31 Drawing figures

Full	Title	Class	Front	Review	Classification	Date	Reference	Claims	Draw
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☐ 16. Document ID: US 6737866 B2 Relevance Rank: 79

L27: Entry 7 of 18

File: USPT

May 18, 2004

US-PAT-NO: 6737866

DOCUMENT-IDENTIFIER: US 6737866 B2

**** See image for Certificate of Correction ****

TITLE: Method of imaging a vasculature of a patient

DATE-ISSUED: May 18, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Belt; Kenneth W.	Fort Atkinson	WI		
Reichel; Michael	Pittsburgh	PA		

<u>5258717</u>	November 1993	Misic et al.	
<u>5363845</u>	November 1994	Chowdbury et al.	
<u>5417213</u>	May 1995	Prince	
<u>5430378</u>	July 1995	Jones	
<u>5432449</u>	July 1995	Ferut et al.	
<u>5471142</u>	November 1995	Wang	
<u>5477146</u>	December 1995	Jones	
<u>5517120</u>	May 1996	Misic et al.	
<u>5521506</u>	May 1996	Misic et al.	
<u>5548218</u>	August 1996	Lu	324/318
<u>5553619</u>	September 1996	Prince	
<u>5579767</u>	December 1996	Prince	
<u>5590654</u>	January 1997	Prince	
<u>5594337</u>	January 1997	Boskamp	
<u>5610520</u>	March 1997	Misic et al.	
<u>5666055</u>	September 1997	Jones et al.	
<u>5928148</u>	July 1999	Wang et al.	600/420

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
197 09 244	June 1998	DE	
390 476	October 1990	EP	
758 091	February 1997	EP	
803 736	October 1997	EP	

OTHER PUBLICATIONS

Roemer, et al., The NMR Phased Array, Magnetic Resonance in Medicine 16, pp. 192-255, (1990).

Medical Advances, Peripheral Vascular Coil, promotional brochure (Apr. 1997).

Kojima, K. Y., et al., "Lower Extremities: MR Angiography with a Unilateral Telescopic Phased-Array Coil," Radiology, vol. 196: pp. 871-875 (1995).

Jones, R. W., et al., "Minimization of Noise Contributions in Multiple Coils: An Overview of Theories with Recommended Improvements," SMRM, p. 369 (1992).

Hyde, J. S., et al., "Quadrature Detection Surface Coil," MRM 4, pp. 179-184 (1987).

Wang, J., "A Novel Method to Reduce the Signal Coupling of Surface Coils for MRI," ISMRM, vol. 3, p. 1434 (1996).

Baum, R. A., et al., "Multicenter Trial to Evaluate Vascular Magnetic Resonance Angiography of the Lower Extremity," JAMA, vol. 274, No. 11, pp. 875-880 (1995).

Medical Advances, The Whole Picture: The New Medical Advances Peripheral Vascular Coil, promotional brochure.

Lang, E. K., "A Survey of the Complications of Percutaneous Retrograde Arteriography," Seldinger Technic, Radiology, 81: pp. 257-263 (1963).

Hessel, S. J., et al., "Complications of Angiography," Radiology, 138: pp. 273-281 (1981).

ART-UNIT: 2859

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Bradley; Gregory L. Stevenson; James R.

ABSTRACT:

A method is provided for imaging a vasculature of a patient using an MRI system with an array of local coils. The method includes the step of providing a housing by which (I) a first plurality of the coils is arrayed along an anterior surface of the patient, (II) a second plurality of the coils is arrayed along a posterior surface of the patient, and (III) the patient is oriented such that portions of the vasculature between and including the renal and feet portions thereof are aligned substantially coplanarly. The method also includes the step of injecting a contrast agent into the patient. The method further involves acquiring images of the vasculature from approximately the renal portion thereof to an including the feet portion thereof so that the images of the portions of the vasculature are acquired successively in timed relation to a progression of the contrast agent therethrough.

19 Claims, 31 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	Index	Drawings
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☐ 17. Document ID: US 5361765 A Relevance Rank: 79

L27: Entry 18 of 18

File: USPT

Nov 8, 1994

US-PAT-NO: 5361765

DOCUMENT-IDENTIFIER: US 5361765 A

TITLE: Two-part quadrature NMR coil

DATE-ISSUED: November 8, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Herlihy; David J.	New Berlin	WI		
Boskamp; Eddy B.	Menomonee Falls	WI		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Medical Advances, Inc.	Milwaukee	WI			02

APPL-NO: 08/057939 [PALM]

DATE FILED: May 7, 1993

INT-CL-ISSUED: [05] A61B 5/055

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	<u>A61 B 5/055</u>	20060101
CIPN	<u>G01 R 33/32</u>	20060101

CIPS G01 R 33/34 20060101CIPN G01 R 33/36 20060101

US-CL-ISSUED: 128/653.5; 324/318, 324/322

US-CL-CURRENT: 600/422; 324/318, 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 128/653.2, 128/653.5, 324/318, 324/322

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4712067</u>	December 1987	Roschmann et al.	324/318
<u>4740751</u>	April 1988	Misic et al.	324/318
<u>4879516</u>	November 1989	Mehdizadeh et al.	324/318
<u>5221902</u>	June 1993	Jones et al.	324/318
<u>5256971</u>	October 1993	Boskamp	324/318
<u>5261403</u>	November 1993	Saito et al.	128/653.5
<u>5274332</u>	December 1993	Jaskocski et al.	324/318

ART-UNIT: 335

PRIMARY-EXAMINER: Smith; Ruth S.

ATTY-AGENT-FIRM: Quarles & Brady

ABSTRACT:

A quadrature local coil includes a bifurcated first loop positioned on one side of the patient and sensitive to RF magnetic flux generally parallel to the surface of the loop and a second loop positioned on the other side of the patient, opposed to the first loop and sensitive to RF magnetic flux within the patient perpendicular to that to which the first loop is sensitive. In one embodiment, the first and second loops are mounted in opposing concave shells held against and supported by the patient.

7 Claims, 15 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	FIGS	Draw D.
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☐ 18. Document ID: US 6677755 B2 Relevance Rank: 79

L27: Entry 9 of 18

File: USPT

Jan 13, 2004

US-PAT-NO: 6677755

Angiography of the Lower Extremity," JAMA, vol. 274, No. 11, pp. 875-880 (1995).
Medical Advances, The Whole Picture: The New Medical Advances Peripheral Vascular
Coil, promotional brochure.
Lang, E. K., "A Survey of the Complications of Percutaneous Retrograde
Arteriography," Seldinger Technic, Radiology, 81: pp. 257-263 (1963).
Hessel, S. J., et al., "Complications of Angiography," Radiology, 138: pp. 273-281
(1981).

ART-UNIT: 2859

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Stevenson; James R.

ABSTRACT:

A circuit for selectively disabling and enabling n-coils includes n-drivers disposed in a totem-pole configuration. Each of the n-drivers includes two FETs whose gates connect at a common node therefor. Each n-driver is used to operate one of the n-coils by being responsive at its common node to (i) a coil disable signal by activating one FET thereof and deactivating the other FET thereof drawing current away from and thus disabling its corresponding coil and allowing current to flow through the one FET and thus be available as a source of current to a successive one of the n-drivers and (ii) a coil enable signal by deactivating the one FET thereof and activating the other FET thereof thereby allowing current to flow serially through its corresponding coil and the other FET thus enabling its corresponding coil and to be available as a source of current to the successive n-driver.

16 Claims, 31 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWOC	Draw.D
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Term	Documents
(26 AND 3) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	18
(L26 AND L3) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	18

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Application Number

IDS Flag Clearance for Application 10553175**IDS
Information**

Content	Mailroom Date	Entry Number	IDS Review	Last Modified	Reviewer
M844	2005-10-14	9	Y <input checked="" type="checkbox"/>	2006-10-13 11:24:02.0	BShrivastav
<input type="button" value="Update"/>					